



MECHANICAL DATA SHEET: VESSEL

PLANT ITEM No.

24590-PTF-MV-TLP-VSL-00009B

Project:	RPP-WTP	P&ID:	24590-PTF-M6-TLP-P0001
Project No:	24590	Process Calculation:	Deleted Δ 2
Project Site:	Hanford	Vessel Drawing	24590-PTF-MV-TLP-P0002
Description:	LAW SBS Condensate Receipt Vessel		

Reference Data

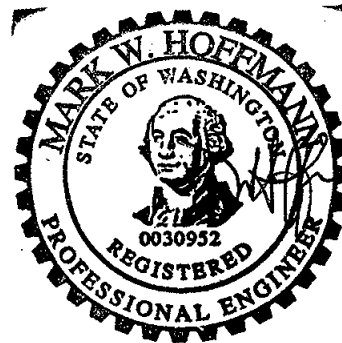
Charge Vessels (Tag Numbers)	Not Applicable
Pulsejet Mixers / Agitators (Tag Numbers)	TLP-PJM-00009, TLP-PJM-00010, TLP-PJM-00011, TLP-PJM-00012, TLP-PJM-00013, TLP-PJM-00014, TLP-PJM-00015, TLP-PJM-00016
RFDs/Pumps (Tag Numbers)	Not Applicable

Design Data

Quality Level	CM	Fabrication Specs	24590-WTP-3PS-MV00-TP001		
Seismic Category	SC-III	Design Code	ASME VIII Div 1		
Service/Contents	Radioactive Liquid	Code Stamp	Yes		
Design Specific Gravity	1.6	NB Registration	Yes		
Maximum Operating Volume	gal	114,060	Weights (lbs)	Empty	Operating
Total Volume	gal	130,010	Estimated	218,400	1,769,100
			Actual *		1,303,300

Inside Diameter	inch	312	Wind Design	Not Required	
Length/Height (TL-TL)	inch	328	Snow Design	Not Required	
	Vessel Operating	Vessel Design	Coil/Jacket Design	Seismic Design	24590-WTP-3PS-FB01-T0001
					24590-WTP-3PS-MV00-TP002
Internal Pressure	psig	0	15	NIA	Seismic Base Moment *
External Pressure	psig	0.22	8	NIA	Postweld Heat Treat
Temperature	°F	167	192	NIA	Corrosion Allowance
Min. Design Metal Temp.	°F	40			Hydrostatic Test Pressure *

Note: Please note that source, special nuclear and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA), are regulated at the U.S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts, that pursuant to the AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.



EXPIRES 12/10/06

This Bound Document Contains a total of 5 Sheets.

2	1/27/05	Issued for Permitting Use				
1	9/13/03	Issued for Permitting Use	Jessica Jackson	Chan Chung	Cliff Slater	Mark Hoffmann
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Materials of Construction

Component	Material	Minimum Thickness / Size	Containment
Top Head	UNS N08367	See Drawing	Auxiliary (See Note 1)
Shell	UNS N08367	See Drawing	Primary (See Note 1)
Bottom Head	UNS N08367	See Drawing	Primary (See Note 1)
Support (Skirt)	SA 240 304 with max. Carbon of 0.030 %	See Drawing	N/A
Jacket/Coils/Half-Pipe Jacket	NIA	NIA	N/A
Internals	UNS N08367	See Drawing	Thermowell Primary (See Note 1)
Pipe	UNS N08367 Seamless or N10276 \triangle_2	See Drawing	See Note-1
Forgings/ Bar stock	UNS N08367	See Drawing	As Note-1 for Nozzle Necks
Gaskets	NIA	NIA	NIA
Bolting	NIA	NIA	NIA

Miscellaneous Data

Orientation	Vertical	Support Type	Skirt
Insulation Function	Not Applicable	Insulation Material	Not Applicable
Insulation Thickness (inch)	Not Applicable	Welds Surface Finish	De-scaled as laid

Remarks

* To be determined by the vendor.

Note 1: All welds forming part of the primary and auxiliary containment including nozzle attachment welds shall be subjected to 100% volumetric examination.

Note 2: Deleted

Note 3: Vessel volumes are approximate and do not account for manufacturing tolerances, nozzles, and displacement of internals

Note 4: Contents of this document are Dangerous Waste Permit affecting.

Note 5: This vessel is in a Black Cell.

Note 6: Deleted. \triangle_2

Note 7: BNI shall ensure that an additional 0.056" is available for erosion in the bottom head and the Seller shall report the minimum thickness required for all specified loading conditions, exclusive of erosion and corrosion allowances. \triangle_2

Note 8: BNI shall ensure that an additional 0.036" is available for erosion in the lower 4" of the interior conical surface of the pulse jet mixers. \triangle_2

Note 9: All hydrodynamic loads are for BNI internal use only and are to be disregarded by the Seller. \triangle_2




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PLANT ITEM No.

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Equipment Cyclic Data Sheet

Plant Item Number	24590-PTF-TLP-VSL-00009B 
Component Description	Parent Vessel

The information below is provisional and envelopes operational duty for fatigue assessment. It is not to be used as operational data.

Materials of Construction	UNS N08367
Design Life	40 years
Component Function and Life Cycle Description	This vessel receives intermittently LAW SBS condensate, off-spec effluent, and treated LAW concentrate. The vessel is emptied manually whenever it gets filled to the high level. Washdown is once per year.

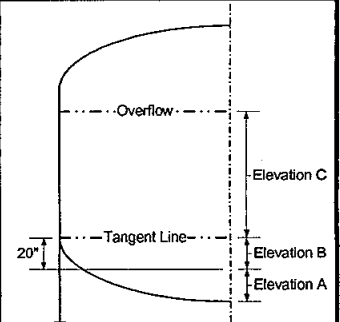
Load Type		Min	Max	Number of Cycles	Comment
Design Pressure	psig	-8	15	10	Nominal assumption
Operating Pressure	psig	-0.22	0	5700	
Operating Temperature	°F	68	167	5700	Uniform material temperature range, not between two points
Contents Specific Gravity		1.0	1.6	2080	Nominal assumption
Contents Level	inch	28	358	5700	Coincident with pressure cycles
Localized Features					
Nozzles		Within 50°F of operating temperature range		As above	

Hydrodynamic Loading (Notes 6 & 9)

In normal operation, pulse jet mixers discharge liquid into the parent vessel imposing a cyclical hydrodynamic load on all internal components. Occasionally, an upset condition designated 'overflow' causes air to be discharged from any single pulse jet mixer. All internal components shall be designed for the combination of the normal operational hydrodynamic loads and overflow loads, and this load combination is also to be assumed to act concurrently with seismic loads.

The following table indicates the normal hydrodynamic pressure for at ranges of elevations in the vessel and the number of design cycles for each condition. The hydrodynamic forces cycle between the indicated pressure ranges applied across the projected area of the component. Positive hydrodynamic forces act in the radial, outward direction and the vertical, upward direction. Seller shall apply the radial load simultaneously in the radial direction and normal to the radial direction in the horizontal plane.

Normal Operation Hydrodynamic Pressure Range, psi						Number of Cycles
Elevation A		Elevation B		Elevation C		
Radial	Vertical	Radial	Vertical	Radial	Vertical	
-0.15 to 0.25	-0.15 to 0.15	-0.05 to 0.12	-0.15 to 0.15	-0.03 to 0.05	-0.06 to 0.15	3.7 X 10 ⁶



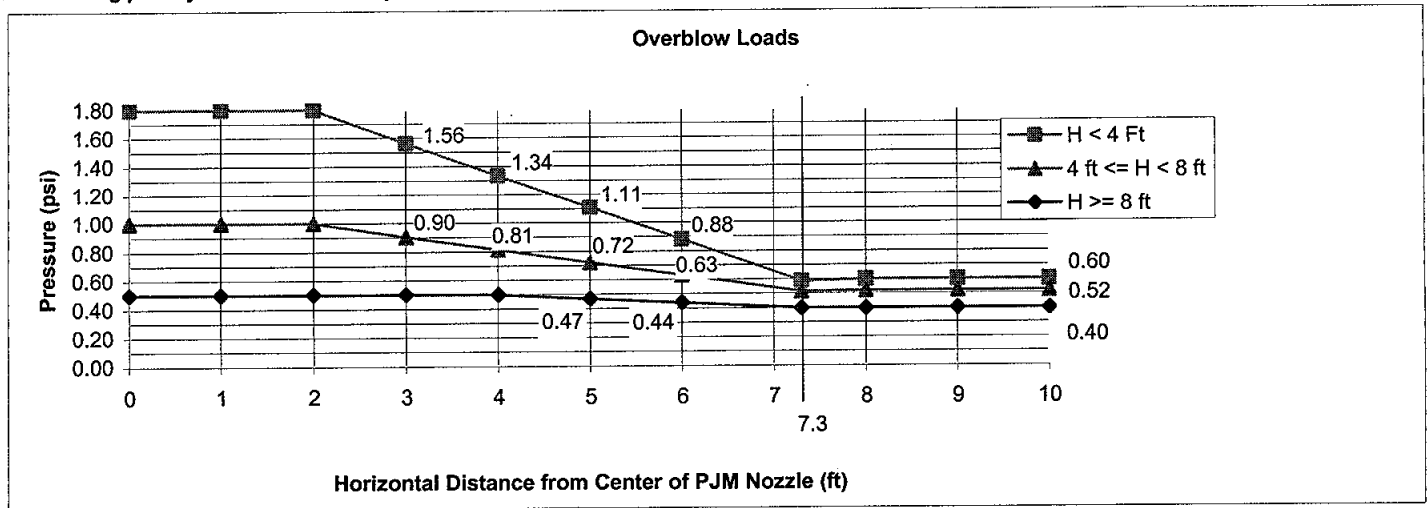


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Overblow loads vary as a function of the distance from the center of the overblowing pulse jet mixer nozzle and the elevation 'H' above the overblowing pulse jet mixer nozzle as plotted:



The overblow pressure shall only be applied to the projected area of the overblowing pulse jet mixer in the vertical, upward direction and to all surrounding components in the horizontal plane, radiating from the overblowing pulse jet mixer. Seller shall consider that any single pulse jet mixer may overblow 100 cycles.

Notes

- **Cycle increase:** The Seller must increase the numbers of operational cycles given above by 10% to account for commissioning duty unless otherwise noted.



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Equipment Cyclic Data Sheet

Plant Item Number	TLP-PJM-00009, TLP-PJM-00010, TLP-PJM-00011, TLP-PJM-00012, TLP-PJM-00013, TLP-PJM-00014, TLP-PJM-00015, TLP-PJM-00016
Component Description	Pulse Jet Mixers

The information below is provisional and envelopes operational duty for fatigue assessment. It is not to be used as operational data.

Materials of Construction	UNS N08367
Design Life	40 years
Component Function and Life Cycle Description	<i>These pulse jet mixers are cyclically loaded using vacuum to fully fill the vessel with process liquid and compressed air to fully empty the vessel. The pulse jet mixers are contained within a parent vessel with varying liquid level. They shall be designed to cycle between the maximum design pressure and the minimum design pressure plus the external static head imposed by the parent vessel. The pulse jet mixer supports shall be designed to cycle between fully buoyant (pulse jet mixer empty and parent vessel full) and fully loaded (pulse jet mixer full and parent vessel empty) in addition to thrust.</i>

Load Type		Min	Max	Number of Cycles	Comment
Design Pressure	psig	FV	83	10	Nominal assumption
Operating Pressure	psig	FV	58	3.7 X 10⁶	
Operating Temperature	°F	68	167	3.7 X 10⁶	<i>Pressure cycles to be at 167° F and non-coincident with temperature cycles. The range given is uniform material temperature range, not between adjacent points.</i>
Contents Specific Gravity		1.0	1.6	2080	Nominal assumption
Contents Level	inch	Empty	Flooded	3.7 X 10⁶	Coincident with pressure cycles
Localized Features					
Supports		As above		As above with contents level changing coincident with pressure cycles.	

Notes

- **Cycle increase:** The Seller must increase the numbers of operational cycles given above by 10% to account for commissioning duty unless otherwise noted.